

Budde.—Experimental researches on the intensity of diffracted light, II., by J. Fröhlich.—Some observations on the works of Herren Lommel, Glazebrook, and Mathieu, by E. Ketteler.—On the condensation of gases on surfaces, by H. Kayser.—Researches on the dependence of the molecular refraction of liquid combinations on their chemical composition, by H. Schröder.—On Lefrange's equations of motion, by B. Weinstein.

Journal of the Franklin Institute, April.—A new theory of the suspension system with stiffening truss, by A. J. du Bois (concluded).—Adaptation of Euler's formula to American long column experiments, by W. H. Barr.—The Flannery boiler-setting for the prevention of smoke, by C. A. Ashburner.—Milk, by R. Haines.—The fire-underwriters' regulations respecting the use of the electric light.—On the filtration of water for industrial purposes, by P. Barnes.—The sugar-beet industry, by L. S. Ware and R. Grimshaw.—The Hudson River tunnel, by S. H. Finch.

Bulletins de la Société d'Anthropologie de Paris, tom. iv, fasc. iv, Paris, 1881.—This, the latest quarterly number of the *Bulletins*, contains the concluding part of M. Topinard's paper on his facial goniometer.—Observations by L. Manouvrier on the relations between the weight of the cranium and that of the maxillaries and the femur, with a view of trying to determine the relations between the several parts of the body connected with the cerebral, digestive, and motor functions.—Reports by M. Ledouble of a case of variation in the clavicular trapezius; and on the occurrence in man of the abnormal muscle named by Wood, the *supercostalis*; a case of atavism in the occurrence, in a woman, of the flexor profundus digitorum of the orang-outang, by M. Chuzinski.—On the crania of criminals preserved at Brest, by M. Corre.—On the craniology of criminals, by Dr. Ardouin, who also contributes an interesting paper on the results of the Medical Statistical Tables of Japan, published at Tokio in 1880.—M. Leon Metchnikoff gives the result of his ethnological observations while in Japan on the different races occupying the country, and his views as to their probable origin.—M. Verneau considers the type and origin of the ancient inhabitants of the Canaries; and M. Manouvrier describes at great length the result of his observations on eleven natives of Tierra del Fuego, in the Jardin d'Acclimatation, at Paris. His remarks gave rise to prolonged discussions among the Members of the Society, and were supplemented by a communication from M. Topinard, based on personal observation of these savages, and by a *résumé* by M. Hovelacque of all that is known of the people and their country, through the reports of English and French travellers.—M. Magitot describes the abnormal characters of a dwarf, presented last October by Baron Larrey to the Académie de Médecine; and M. de Quatrefages reports the case of a dwarf smaller than Tom Thumb, and in whom, he believed, that the disproportionally large size of the head was due to hydrocephalus.—M. Parrot brought forward a case of megaloglossis, combined with idiocy, in a child of two years of age.—M. Laborde presented to the Society his essay on the experimental and morphological function of the semi-circular canals in animals, in which he believes we may discover that of a "sensitivo-motor" apparatus, intended to render the sense of hearing more complete. M. Delaunay, in summing up the conclusions he has arrived at in his labours in the field of general pathology, considered the various degrees of liability towards certain diseases shown at different ages, by either sex, and among different races. The only contributions towards palæontological inquiry contained in this number are: M. Hamy's report of the progress of the excavations at Bollwiller, whose deposits would appear to belong to the latest neolithic age; Prof. Carl Vogt's communication of the discovery by M. Roth, in the Pampas of La Plata, of a human skeleton lying below the carapace of a fossil glyptodon; and the presentation, by M. Vinson, of a chromolithographic reproduction of a celto-iberian inscription, found near Sigüenza. M. Vinson is of opinion that we have as yet no authority for accepting the theory of any close affinity of the Basques with the ancient Iberians.

Memorie della Società degli Spettroscopisti Italiani, March.—Solar observations made at the Royal Observatory of Palermo in the fourth quarter of 1881, by Prof. Ricco.

SOCIETIES AND ACADEMIES

LONDON

Zoological Society, May 2.—Prof. W. H. Flower, LL.D., F.R.S., president, in the chair.—Before commencing the usual

proceedings, the president called attention to the fact that one of the communications made to the previous meeting was from the pen of Mr. Charles Darwin; and took the opportunity of referring to the labours and character of the illustrious naturalist, whose work had so profoundly modified not only zoological science, but so many other departments of human thought.—Mr. Slater exhibited a drawing of a Tapir presented to the Society by Mr. Fritz Zuercher in August last, which had been captured on the Yuruari River in Venezuela. Mr. Slater observed that in form and colour this animal seemed to agree better with *Tapirus dowii* than with the ordinary *T. americanus*, and suggested that it was quite likely that the former species might be the Tapir of the northern coast-region of Columbia and Venezuela.—Mr. J. E. Harting, F.Z.S., made some remarks on the desirability of adopting a standard of nomenclature when describing the colours of natural objects.—Dr. Hans Gadlow, C.M.Z.S., read a paper on the structure of feathers in relation to their colour, in the course of which he endeavoured to show how the optical appearances of the various colours met with in the feathers of birds were produced.—Prof. Flower, F.R.S., gave an account of the cranium of a Cetacean of the genus *Hyperoodon* from the Australian Seas, upon which he proposed to found a new species, *H. planifrons*.—A communication was read from Dr. O. Staudinger containing the description of some new and interesting species of Rhopalocera from the New World.—A communication was read from Mr. H. J. Elwes, F.Z.S., containing a description of a collection of butterflies made on the Tibetan side of the frontier of Sikkim, amongst which were examples of several species new to science.—A communication was read from Mr. Edgar L. Layard, F.Z.S., describing a new species of Parrot of the genus *Nymphicus* from Uvée, one of the Loyalty group, which he proposed to call *Nymphicus uvensis*.

Geological Society, April 16.—J. W. Hulke, F.R.S., president, in the chair.—The President remarked that it would argue a degree of indifference with which the Society could not be charged, if the meeting were to proceed to the transaction of the ordinary business, without some reference to the sad loss sustained by the whole scientific world within the last few days, in the death of that illustrious naturalist, whose remains had been consigned that morning to their last resting-place at Westminster. He added that the spectacle presented by the vast assemblage of people who came together to witness the obsequies of Mr. Darwin, was of the most soul-stirring kind, and constituted the grandest conceivable testimony of respect for the memory of the distinguished philosopher who had just passed from among us.—S. S. Buckman, Hugh Salvin Holme, Collet Homersham, and Joseph B. Tyrrell were elected Fellows of the Society.—The following communications were read:—On fossil Chilostomatous Bryozoa from Mount Gambier, South Australia, by Arthur W. Waters, F.L.S., F.G.S.—*Thamniscus*: Permian, Carboniferous, and Silurian, by George W. Shrubsole, F.G.S.—On the occurrence of a new species of *Phyllopora* in the Permian limestones, by George W. Shrubsole, F.G.S.—On the relations of the Eocene and Oligocene strata in the Hampshire Basin, by Prof. John W. Judd, F.R.S., Sec.G.S. The section at Whitecliff Bay, in the Isle of Wight, affords us the means of determining the true order of succession of nearly 2000 feet of Tertiary strata, and is therefore employed as a standard to which to refer the strata seen in sections where the order of succession is not so clear. The author supported the views of Prof. Prestwich as to the limits of the Bracklesham series, as opposed to the opinions expressed on the subject by the Rev. O. Fisher. He pointed out the confusion which has arisen from the correlation of certain strata in the Hampshire basin with the barren Lower and Upper Bagshots of the London area, in which fossils are so rare as to render their geological age somewhat doubtful. To the Lower Bagshot some authors have referred 660 feet of the strata seen at Alum Bay; while other authors have restricted that name to about 73 feet of the same section. The age of the Upper Bagshot of the London basin is admitted by all authors to be very doubtful. The only way to avoid the confusion unavoidable from using the same names for strata, the correlation of which was so hypothetical, was to employ local names for both sets of beds. He proposed to refer to the freshwater sands below the Bracklesham and Bournemouth strata, containing a distinctive flora, as "the Studland beds," and the sands above the Barton clay by the old name of "the Headon Hill Sands." Above these sands are a series of clays only about 40 feet thick at Whitecliff Bay, but much thicker at Headon Hill and Hord-

well Cliff. These sands and clays form the Headon group; they consist of freshwater strata with bands of limestone and lignite, but including numerous inconstant intercalations of layers containing marine shells, for the most part much dwarfed. The age of the Headon group, as shown by the fossils which it contains, is that of "the zone of *Cerithium concavum* of continental authors. The brackish-water Headon group is succeeded at Whitecliff Bay by nearly 100 feet of purely marine strata. These marine beds, which had been shown to rest on an eroded surface of the Headon beds, contain the remarkable fauna which had been recognised by many British and foreign geologists as that of the Lower Oligocene. Similar strata with the same fossils are found in the New Forest, at Lyndhurst, Brockenhurst, Roydon, and other points, and there also attain a considerable thickness. It was pointed out that this marine series is quite distinct from the Headon, or zone of *Cerithium concavum*, with which it had been confounded. The author had been very severely criticised for the views which he had put forward in a former paper as to the manner in which the Brockenhurst series is represented in the section at the west end of the Isle of Wight. There was much difficulty in these variable estuarine beds in correlating the beds seen in Colwell Bay with those exposed in the cliffs of Headon Hill. With several previous authors on the subject, he maintained that the great series of sandstones and limestones forming Warden Point and How Ledge are continuous with those exposed in the face of Headon Hill, and, consequently, that the marine beds of Colwell Bay, overlying those limestone series are younger than the brackish-water bands interstratified with the Headon beds of Headon Hill. His critics, however, insisted that these two beds agreed with one another in such a manner that they must be regarded as parts of the same bed, separated by denudation. In opposition to this view, it was pointed out that the Colwell Bay bed is of the most inconstant character, and long before reaching Headon Hill is seen to be on the point of thinning out and disappearing altogether. In conclusion, the author pointed out that his own interpretation of the succession and correlation of the strata in the Hampshire basin brings them into complete harmony with that which is maintained by the great majority of continental geologists, while that of his critics appeared to be hopelessly irreconcilable with their views.

Chemical Society, May 4.—Dr. Gilbert, president, in the chair.—Prof. J. Dewar, F.R.S., delivered a lecture on the recent development of the theory of dissociation. The lecturer, after referring to the earlier work of Black on "Physical Chemistry," pointed out the origin of the term dissociation, and the experiments made thereon by Deville. Troost proved that dissociation is a function of the temperature, that it is independent of mass, and that the action is reversible; the process resembles in many respects the condensation and volatilisation of a vapour. The experiments in which vapours are conducted along heated porous tubes, only prove that dissociation takes place, but do not tell us the extent of the dissociation. Exact determinations of the partial pressures obtained by heating various substances, as ammoniochloride of silver, water, &c., to certain temperatures have been made, and thus curves have been drawn, which, by inspection, show the pressure necessary to prevent the decomposition of a substance at any particular temperature. Recent investigations have shown that solid substances have a temperature analogous to the "critical point" of gases, above which they cannot exist; thus, when hydrogen sulphide and water are subjected to great pressure at low temperatures, a crystalline hydrate is formed, but above 40° C. this substance cannot be shown to exist, however great the pressure may be. If a mixture of hydrogen and iodine be heated to about 300° C., some hydriodic acid is formed; if hydriodic acid be heated to 300° C., free hydrogen and iodine are formed, and the resulting mixture of hydrogen, iodine, and hydriodic acid has in each case the same composition. The lecturer then explained the cycle of Carnot, and showed how a formula could be deduced from it, by which the latent heat of a chemical compound could be calculated. The importance of the researches of Andrews on the liquefaction of carbon-dioxide was insisted upon, and the analogy of some of the results with the dissociation of chemical bodies pointed out. In conclusion, the author discussed the probability of the dissociation of elements in the sun's atmosphere, and reasoning from a legitimate extension of the known laws of dissociation, inferred that if hydrogen be considered as the elementary form of matter, the sun's atmosphere is most unfavourable to dissociation.

Anthropological Institute, April 25.—Hyde Clarke, vice-president, in the chair. It was announced that Alfred Morrison, F.G.S., and Frederick Harold had been elected Members of the Institute.—The Chairman referred at some length to the great loss that anthropological science had suffered by the death of Mr. Darwin, an Honorary Member of the Institute; Prof. Flower, F.R.S., also offered a tribute to Mr. Darwin's memory. Mr. E. H. Man read a second paper on the aboriginal inhabitants of the Andaman Islands. He touched first upon the important subject of language, and pointed out certain peculiarities connected with the varying use of several sets of possessive pronominal adjectives with particular classes of nouns: in expectation at an early date of a paper on the South Andaman language by the president of the Philological Society, this subject was but briefly dealt with by the author, who next proceeded to describe the Andamanese system of adoption and the recognised degrees of affinity, especially as bearing on the question of marriage, bringing to notice at the same time the erroneous opinions hitherto held on this latter point, as also anent their death and burial customs. Numerous superstitions, beliefs, and traditions were related, the latter treating of the account given by the aborigines regarding the Creation, Deluge, and Dispersion. Mr. Man was careful to state that he had taken the precaution to obtain his information from members of distant tribes who had had no opportunity of intercourse with Europeans or other aliens residing at Port Blair, and added that it was extremely improbable, for the reasons noted in his paper, that any previous generations of these islanders, within historic times, by whom these traditions had been handed down, could have obtained their versions from strangers.

Royal Horticultural Society, April 25.—Sir J. D. Hooker, in the chair.—*Larches attacked by larvæ*: Mr. MacLachlan reported upon some specimens of larch twigs received from Mr. R. Clutton, of Hartwood, Reigate, who stated that thousands of young larches were attacked by larvæ at Box Hill—"the affected trees swarm with little grubs which move about in their cocoons, and seem to suck the juices from the young foliage, leaving it dead, and so kill the trees." They proved to be the larvæ of a minute moth, *Coleophora laricella*, which lays its eggs on the twigs or buds. The larvæ hatched in autumn construct cases of cuticle, &c. The young autumn larvæ attach their cases to the young leaves in spring, which they soon mine and destroy. Mr. MacLachlan is of opinion that the damage done by this insect is not likely to seriously injure larches. He remarked that Box Hill being chalk and dry, was not well suited for the growth of larches.—*Fertilisation of Hoya*: Mr. W. G. Smith referred to this subject, and exhibited flowers with flies attached to the glutinous disks of the pollen-masses. The *Hoya* is highly fragrant. This fragrance is very attractive to insects, which are necessary for fertilisation of this plant. The pollinia are concealed, excepting the dark viscid disks, which are exposed. When an insect alights on the flowers, one foot at least slips and gets caught by one of the fine little glutinous disks. In its effort to escape two, three, or even four other feet are almost sure to get similarly caught. The insect then tries with all its power to free its limbs. If successful the pollen-masses are withdrawn out of the pouches by the feet. The basal appendages of each pair of pollinia are elastic, and when in the pouch they are like an extended spring, but the instant the masses are drawn out, the spring closes, and the two pollen masses quickly cross each other and hold tightly on to the insect's little claws. If the insect is weak, it cannot withdraw its legs at all, and so perishes on the flower; but if strong, it flies away with one to five pairs of pollinia clasped round its feet. Sometimes an insect breaks part of its leg off in trying to withdraw it. The five stigmas are not ready to receive the pollen at the time the pollen is mature; so that it is only when the insect realights on some neighbouring *Hoya*-flower in a more advanced stage of growth that cross-fertilisation takes place by its treading on the exposed stigmas.

EDINBURGH

Royal Society, May 1.—Mr. Milne Home, vice-president, in the chair.—Prof. Piazza Smyth, Astronomer-Royal for Scotland, read a paper on some points in the meteorology of Madeira, both absolute and comparative. By a careful comparison of the mean monthly temperatures, the maximum temperatures, and the mean daily range, during the months of June and July at Madeira and Lisbon, it appeared that the temperature at the

former was markedly more equable. A like comparison was also instituted for the corresponding *annual* variations at Madeira, Lisbon, Jerusalem, and Scotland, and the same wonderful equableness was shown to exist. Observations with the wet- and dry-bulb thermometer, and spectroscopic indications of the "rain-band" proved the climate of Madeira to be at the same time remarkably humid, which at once explains its cold summers and warm winters. This striking humidity the author traced to the influence of the Gulf Stream, a branch of which trends south from the Bay of Biscay past the coast of Portugal. That the ocean waters around Madeira are peculiarly warm, was demonstrated by the late Sir Wyville Thomson in the *Challenger* Expedition. The abundant presence of watery vapour in the atmosphere also seems to have a marked influence upon the flora and fauna, which are very different from what would be expected when latitude alone is considered.—Mr. P. Geddes communicated a paper by Mr. F. E. Beddard, B.A., on the anatomy and histology of *Pleurochæta Moseleyi*, a new genus and species of earthworms, which had been brought home by Prof. Moseley from Ceylon. The chief characteristics of this species noted were, that the setæ are not arranged in continuous lines round the body, but in two lateral groups, that there are no segmented organs, and that the capillaries extend into the hypoderm, as in the leech.—Prof. Heddle, in the first of three notes, described a leaf-bed which he had discovered at the base of a high precipice at the north-west corner of the island of Canna. The bed consists of a highly laminated brown clay, easily split by tapping or by inserting the edge of a knife. This clay, when it comes down to the water's edge, is acted upon by the waves to form the so-called Fuller's earth. In the second note, the author intimated that the inner Hyskier—a group of skerries some nine miles from Canna—was formed of the pitchstone porphyry of the Scur of Eigg, which is about twenty-two miles distant. The third note related to a supposed organism from the marble of Sutherland, which the author, from his intimate acquaintance with the structure and mode of occurrence of minerals, was certain was not a mineral. A specimen had been sent to Dr. Carpenter, who, without any knowledge as to where it had been got, described it as being very Eozoic.—Mr. J. Aitkin communicated a brief note on the selective absorption of seawater for light, on which he had made some spectroscopic observations.

PARIS

Academy of Sciences, May 1.—M. Jamin in the chair.—The death of Mr. Darwin was commented upon by the President and by M. de Quatrefages.—On some reactions of bichloride of mercury, by M. Debray.—On the employment of liquefied gases, and particularly ethylene, for production of low temperatures, by M. Cailletet. A thermometer immersed in liquid ethylene indicated about -105° ; whereas protoxide of nitrogen boils at -88° . In utilisation the liquid was, on opening an orifice in the receiver, projected through a glass tube on the apparatus to be cooled. Suddenly diminishing the pressure of compressed oxygen cooled to at least -105° , one observes tumultuous ebullition for a little; (at -88° oxygen gave merely a fine mist). Ethylene has the property of remaining liquid and transparent at temperatures where protoxide of nitrogen and carbonic acid become solid and opaque.—Separation of gallium, by M. Lecoq de Boisbaudran.—Report on a memoir of M. C. Stephanos, entitled "Memoir on Groups of Binary Forms having the same Jacobian."—Determination of the difference of longitude between Paris and Besançon, by MM. Barnaud and Leygue. A chronometric observatory is being founded at Besançon, for the benefit of the watchmaking industry there, and the difference of longitude between the site chosen and the Montsouris Observatory is found to be 14m. 36.267s.—Developments in series of a holomorphic function in an area limited by arcs of the circle, by M. Appell.—On certain ternary quadratic forms, by M. Picard.—On photographs of the spectrum of the nebula of Orion, by Prof. Draper.—On the polarisation of electrodes and on the conductivity of liquids, by M. Bouty. From experiments in which the electromotive method of M. Lippmann was applied to measuring the conductivity of acidulated water with a very weak electromotive force (e.g. that of a zinc-cadmium element), he concludes that a liquid has only one way of conducting electricity (not two, an *electrolytic* and a *metallic*, as some physicists suppose), whatever the special phenomena of the electrodes.—Influence of a metal on the nature of the surface of another metal placed at a very small distance, by M. Pellat. Two metal surfaces placed opposite each other at an

interval of a few millimetres or tenths of a millimetre, have their superficial layers temporarily altered (as one finds on measuring the difference of potential); after separation the change gradually disappears. The author regards the action as not electric, but purely material, and depending on the nature of the influencing metal (it is great with lead, less with copper, *nil* with zinc). Metals seem to emit, at ordinary temperature, a volatile substance, which, deposited on the surface of objects, chemically modifies their nature.—On the liquefaction of ozone, by MM. Hautefeuille and Chappuis. By compressing, at about 125 atm., a mixture of oxygen and ozone in a bent tube, part of which was cooled with a jet of liquid ethylene (see above), they obtained ozone in liquid drops of a dark indigo blue colour. The vapourisation of the liquid is not very rapid, even at atmospheric pressure.—Action of insoluble metallic sulphides on a solution of acid sulphate of nickel in presence of sulphuretted hydrogen, by M. Baubigny.—Oxidation of pyrogallol in presence of gum arabic, by MM. de Clermont and Chautard.—Chemical study of various products of Uruguay, by M. Sacc. This relates to caoutchouc from various fig trees, the camphor tree, a blue-flowered vetch, and chickweed.—Observations relative to a group of fossil Suidæ, whose dentition has some Simian characters, by M. Filhol. These fossils are from the upper eocene. Other points of similarity are the shortening of the skull and the form of the temporo-maxillary articulation.—Researches on the anatomy of some Echinida, by M. Kahler.—The Grotto Lympha, by M. Riviere. He finds evidence of the contemporaneity of the brecciform deposits of this grotto (discovered at Nice in 1878, and containing remains of *Elephas*, *Lagomys*, *Capraprinigenia*, *Cervus*, *Bos*, &c.), with quaternary man.—On the reptiles found in the gault of the east of France, by M. Sauvage. Eleven have been discovered. *Inter alia*, crocodiles existed of much larger size than those of the Cambridge strata. The principal Dinosaurian was a *Megalosaurus (superbus)* of gigantic size, differing in several features from the *M. Bucklandi* of the oolite in England.—A hypsometric map of the rivers of European Russia, by Col. de Tillo, was presented by M. Daubrée. It is observed that the principal water-courses of that country change pretty abruptly in general direction. M. Holtz noted several observations relative to intermittent springs.

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